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ABSTRACT

A study was conducted by the Center for the Study of Community Colleges to assess student knowledge in the liberal arts in four large urban community college districts (i.e., Chicago, Los Angeles, Miami-Dade, and St. Louis). The study used both a student characteristics survey and the General Academic Assessment (GAA), a content test designed to measure the knowledge of student cohorts, rather than individual students, with respect to humanities, sciences, social sciences, mathematics, and English usage. Study findings, based on GAA forms completed by 8,026 students in the 23 participating colleges, included the following: (1) student knowledge was related to both age and to the number of courses completed in particular areas; (2) the age relationships showed up in English usage, social sciences, and humanities (the older the student the higher the score on those scales), but not in mathematics or science; (3) the highest scores were achieved by students who were attending college for their personal interest, with those preparing for transfer making the second highest scores; (4) scores tended to increase for each of the subject areas to the extent that students took courses in those areas; and (5) students' own assessments of their skills showed high correlations with their GAA scores. (RO)

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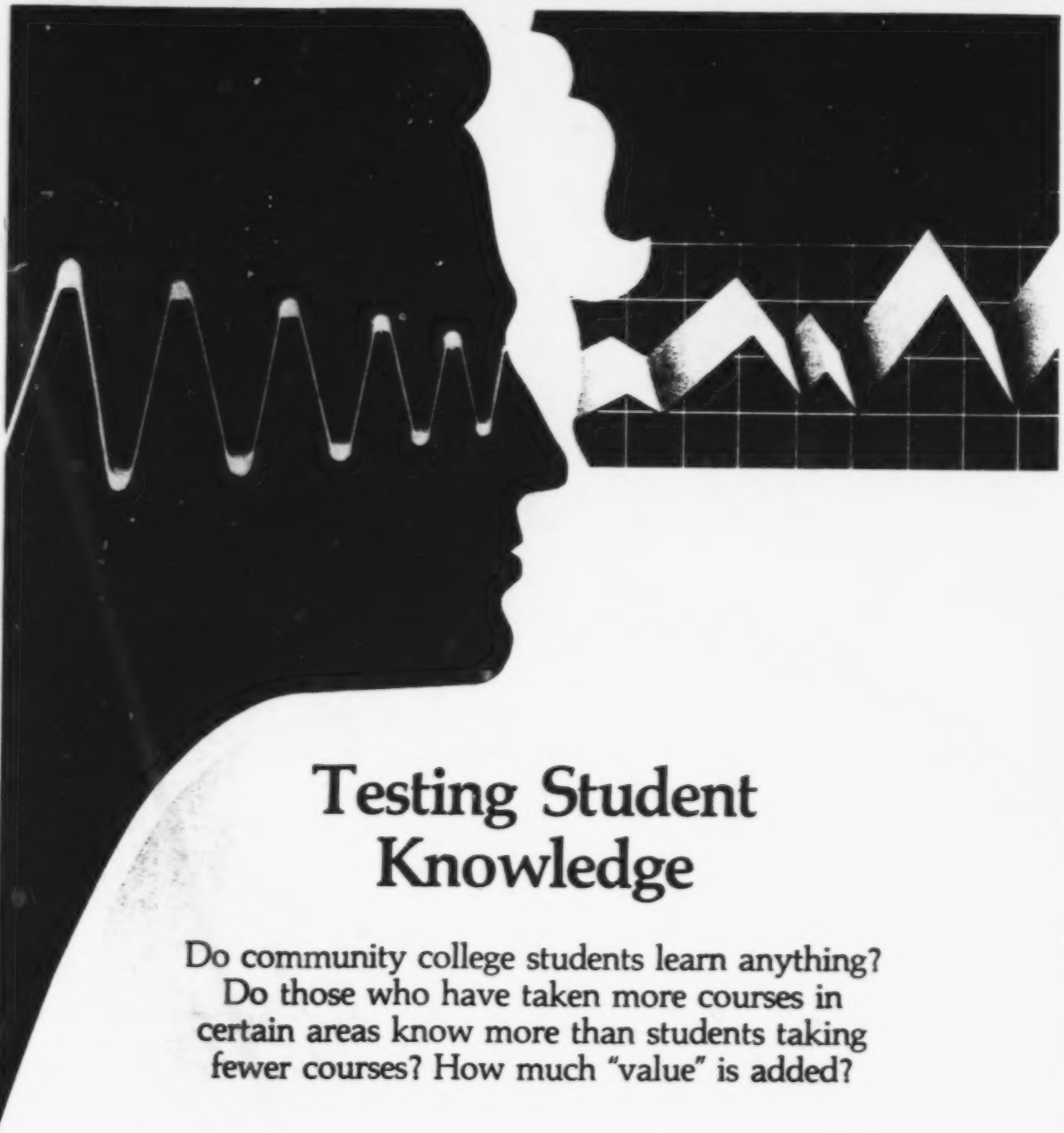

Testing Student Knowledge

Do community college students learn anything? Do those who have taken more courses in certain areas know more than students taking fewer courses? How much "value" is added?

Despite the varied roles discerned by community colleges, as educational institutions they are of necessity judged by the value they add to their students' intellectual capabilities and moral qualities. A school must teach, or what is it for? Students must learn, or what has it done? Although access is essential as a prime component in the community college mission, students must eventually display some element of learning or goal attainment lest the access be a hollow victory.

Easily said, less easily measured. How much do students actually learn in community colleges? The question is usually answered obliquely. Many colleges and some state systems maintain estimates of their matriculants' success when they transfer to senior institutions. Program planners in most colleges also have an idea of the number of students obtaining jobs in the field for which they were trained. And some colleges survey their alumni periodically, asking if they were pleased with the experiences provided them by the college.

Curiously, the question of student learning seems the one measure of value added that is least likely to be answered. Comparing the grades earned by community college transfers with those made by students who began at the universities is of marginal utility because relatively few students transfer. Measures of job-gaining are better, even though most of the reports reveal serious methodological flaws. Less useful are studies in which former students are asked if they felt they had learned. The answer to that question is too often confounded with the student's generalized attitude of satisfaction with the entire college experience.

What learning measures are available? Because they were designed for a different purpose, most tests do not answer questions about the knowledge gained by cohorts of students. Tests administered in individual classrooms are almost invariably course specific; students who did not take those courses are at a disadvantage in answering the questions. Nationally normed tests in various subject areas are somewhat better, but they suffer the defect of having been built for purposes of screening students. To the traditional test maker, the perfect hundred-item test, when administered to any number of students, is one that yields a mean, median, and modal score of 50, with no student missing all the answers and no student getting all the items correct. By definition, then, half the students are below average and half are above. Although these tests do not measure the learning attained by the entire group, they are popularly employed because they are useful in making decisions about program admission and course-level placement.

Some nationally normed tests show more promise. The American College Testing Program's College Outcomes Measures Project, devised to gain an estimate of student knowledge in general education, has been used with several student cohorts. The National Assessment of Educational Progress draws samples of students aged 9, 13, and 17, showing knowledge for those cohorts on specific questions of mathematics and social science, along with a smaller set of items in other areas of the liberal arts. However, NAEP is concerned with age and regional cohorts; they have not applied their testing program to individual schools.

Item selection and population sampling constitute the main problems in testing community college student knowledge. Of all the universe of knowledge, which questions should be asked when we want to discover what our students know? Should the items be course specific or should they deal with areas of general inquiry? Since a set of items can tap only a minuscule portion of what colleges teach or what students should learn, which items should be selected?

Which students shall respond to the test? It is certainly unnecessary to test all the students in the college if we want only to know what cohorts of students know as compared to other cohorts; population sampling can be readily undertaken.

The General Academic Assessment

It is feasible to assess student knowledge in general areas such as the liberal arts by building an instrument for that purpose and by designing the procedures to fit the realities of community college student attendance. The Center for the Study of Community Colleges did just that in cooperation with the faculty and staff in four large urban community college districts: Chicago, Los Angeles, Miami-Dade, and St. Louis. The results of this administration are instructive in what they reveal about student knowledge at various stages in the community college programs and as this knowledge relates to student demographics. The project, designed for research purposes only, also demonstrated a procedure that can be readily employed in administering tests of this type.

For many years the Center has been tracing trends in the liberal arts and transfer education in community colleges by surveying students and faculty and by tabulating information on curriculum and instructional practices. In conjunction with an Andrew W. Mellon Foundation-sponsored study of the liberal arts, the Center staff developed, field tested, and administered a student survey and content test that would reveal student knowledge in general education and the liberal arts. This General Academic Assessment (GAA) was designed to assess knowledge among cohorts of students, not the learning of individual students. It was prepared so that comparisons could be made between students entering the colleges, those who had completed one or more semesters, and those who had various aspirations. The items were selected so that a student's general knowledge could be assessed regardless of where or when that knowledge was gained.

The survey portion of the GAA asked students such background questions as age, number of credits earned, educational and occupational aspira-

tions, number of liberal arts courses taken, and self-assessment of their skills in those areas. Representative items in the humanities, sciences, social sciences, mathematics, and English usage, were drawn from several sources: The National Assessment of Educational Progress, Educational Testing Service, The City Colleges of Chicago, and Miami-Dade Community College. Center staff members culled the items with the help of instructors, counselors, and administrators from several California community colleges. Final selection was made by panels of faculty and administrators from the colleges in which the instrument was to be given.

The items were arrayed in five forms and tried out with around 1,300 students in five community colleges in California and Kansas. Questions in the demographic portion of the instrument were selected from those that had proved useful in the Center's earlier surveys of more than 12,000 students in Washington and California. After revision, the final instrument included 19 demographic and student experience questions and 57 items in humanities, 60 in English usage, 52 in mathematics, 59 in science, and 71 in social science. The items were distributed at random across the five forms so that each form had a sampling of items in the five areas and each could be completed within one 50 minute class period.

Class sections were used as the unit of sampling because that is the most feasible way of getting a random sample of students enrolled in credit classes. Because a student taking four classes has four times as many chances of being in a sampled class section as a student who is taking only one class, this method has the disadvantage of skewing the sample in the direction of full-time students. Nevertheless, the

GAA SURVEY, COMBINED DISTRICTS: TABLE 1
Means on Scales by Number of Completed College Units

	GENERAL ACADEMIC ASSESSMENT SCALES					
Completed Units	Mathematics	Literacy	Social Science	Humanities	Science	Total Liberal Arts
0-14	4.45	4.73	4.64	3.02	4.89	21.73
15-29	4.84	4.84	4.80	3.13	5.05	22.65
30-44	4.88	4.90	4.88	3.31	5.25	23.23
45-59	5.18	4.96	5.13	3.54	5.27	24.07
60 or more	5.51	5.55	5.58	4.24	5.84	26.71
Total Sample	4.85	4.92	4.92	3.35	5.17	23.21

GAA SURVEY, COMBINED DISTRICTS: TABLE 2
Means on Scales by Self-Rating on Scale-Related Skill

	GENERAL ACADEMIC ASSESSMENT SCALES				
Self-Rating	Mathematics with Rating on Use of Algebra	Literacy with Rating on Editing Written Material	Social Science with Rating on Understanding Political Ideologies	Humanities with Rating on Understanding Art, Music, Drama	Science with Rating on Understanding Scientific, Technological Developments
Poor	3.82	4.16	4.22	2.66	4.44
Fair	4.49	4.58	4.60	2.99	4.81
Good	5.16	5.08	5.17	3.48	5.25
Excellent	6.17	6.28	5.82	4.22	6.34
Total Sample	4.85	4.92	4.92	3.35	5.17

GAA SURVEY, COMBINED DISTRICTS: TABLE 3
Means and Percent Change of Means by Number of Completed Courses in Scale-Related Curriculum

Number of Completed Courses in Scale-Related Curriculum	GENERAL ACADEMIC ASSESSMENT SCALES									
	Mathematics		Literacy		Social Science		Humanities		Science	
	Mean	%Change	Mean	%Change	Mean	%Change	Mean	%Change	Mean	%Change
None	4.41	–	4.87	–	4.60	–	2.88	–	4.88	–
One	4.63	+ 5	5.00	+3	4.74	+3	3.16	+10	5.26	+8
Two	5.08	+10	4.97	−1	4.95	+4	3.44	+9	5.30	+1
Three or more	5.91	+16	5.01	+1	5.65	+14	4.31	+25	5.88	+11
% Difference between "No courses" and "Three or more" means		+34		+3		+23		+50		+21

sample, based on duplicated head count, is an accurate representation since the full-time students represent higher proportions of the full-time equivalent enrollment in the college.

A total of 8,026 students in the 23 participating colleges (9 in Los Angeles, 4 in Miami, 3 in St. Louis, and 7 in Chicago) completed the forms. Their responses were tallied according to total score and to individual subtests in humanities, sciences, social sciences, mathematics, and English usage. Scores were converted to 10 point scale scores for each of the areas, and a cumulative scale score was tallied.

Of the students in the sample, 41% were aged 20 or less and another 41% were between ages 21 and 30. Twenty-nine percent (29%) of them had completed between 0-14 units, 22% between 15-29 units, 19% between 30-44 units, 14% between 45-59 units, and 17% indicated that they had completed 60 or more units. Their primary reason for attending college: prepare for transfer, 57%; gain skills necessary to enter a specific occupation, 27%; gain skills necessary to advance in a current occupation, 9%; satisfy a personal interest, 7%. The sample included 10% Asians, 26% blacks, 42% whites, 18% Hispanics. Twenty-three percent reported that English was not their native language.

Results

The findings illustrated considerable diversity among community college students, but they also suggested that student knowledge is related both to age and to the number of courses completed in particular areas. The age relationships showed up in English usage, social sciences, and humanities; (the older the student, the higher the score on those scales) but not in mathematics or science. All of the five scales showed a direct relationship between the number of units a student had completed and the scores made. The highest scores were achieved by students attending college for their personal interest, with those preparing for transfer making the second highest scores on the combined scales. Scores tended to increase for each of the scales to the extent that students took courses in those areas, with the greatest difference being in the humanities and the least difference in English usage.

One of the more interesting findings was that the students' own assessments of their skills in each of the academic areas showed the highest correlation with their scores on that scale. As an example, students were asked, "Compared with other students at this college, how would you rate your ability to understand the implications of scientific and technological developments?" Those students who rated themselves as "poor" scored 4.44 on the science scale while those who rated themselves as "excellent" scored 6.34 on that scale. Students who rated themselves as "poor" in their ability to "edit written material" scored 4.16 on the English usage scale while those who rated themselves as "excellent" scored 6.28. Similar findings obtained for the scales in mathematics when students were asked to "use algebra to solve problems" (3.82 vs. 6.17); for the scale in humanities when they were asked to rate their ability to "understand art, classical music, and drama" (2.66 vs. 4.22); and for social science when they were asked to rate their ability to "understand different political ideologies" (4.22 vs. 5.82).

Conclusion

Administration of the General Academic Assessment demonstrated the feasibility of a form of cohort testing that is rarely employed in community colleges. The instrument, and procedure, cannot be used to assign students to classes or to make any other decision about individuals. However, it can be used to estimate the differences in knowledge exhibited by entering students as compared with the cohorts that have completed a year or two of course work at the institutions. Furthermore, it can be used to assess entering or graduating students' abilities from year to year, thus gaining a measure of overall value added in a time series.

There was no surprise in the finding that students who take more courses in an area are likely to know more about that area than students who take fewer courses. The age-related scale scores proved interesting in that mathematics and science knowledge showed little age-related differences; those areas seem to be school-related, whereas the humanities, social science, and English usage abilities may be enhanced merely by living in and interacting with the culture.

One of the more surprising findings was the accuracy of the students' self assessment. The extremely high correlation between students' self-rating of their abilities and their score made on the scale in that area suggests that community college students are quite realistic, at least in regard to their academic prowess. Students know what they know.

Center staff engaged in the project as a demonstration of what could be done in assessing student knowledge of the liberal arts. The study methodology proved effective in gaining a measure of student ability. Items were selected by community college staff members for their content in each of the five liberal arts areas, with particular attention that the items not be course specific; accordingly, the instrument proved a valid test of general education, within the limits of a quick-score, multiple-choice test.

Because many of the items were borrowed from the copyright holders for use in this one-time research project, the General Academic Assessment is not available for use in other community colleges. However, the design of the entire project is available and might well be adopted for use in other institutions. The procedure and the results are detailed in Riley (1984), available from the ERIC Document Reproduction Service. (ED 246 959)

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